In the Claims

1. (Original) A multi-fabric interconnection system, comprising:

a plurality of first nodes interconnected as a balanced incomplete block design of the form 2-(v, k, 1) = b, wherein v first nodes, arranged in b groups of k first nodes, are interconnected such that each pair of first nodes appears in only one group of the b groups, and

a plurality of first forwarding nodes configured to interconnect the plurality of first nodes;

a plurality of sets of second nodes, wherein each second node is connected to one of the first nodes, and wherein each of the second nodes is interconnected to every other second node.

2. (Original) The interconnection system of claim 1, wherein each second node is interconnected to other second nodes via at least one first node.

3. (Original) The interconnection system of claim 1, wherein each first node includes at least one first switch.

4. (Original) The interconnection system of claim 3, wherein each second node in said plurality of sets of second nodes is interconnected to other second nodes via said at least one first switch.

5. (Original) The interconnection system of claim 4, wherein each of said plurality of sets of second nodes is interconnected to another of said plurality of sets of second nodes via said at least one first switch.

6. (Original) The interconnection system of claim 4, wherein said at least one first switch interconnects one of said plurality of sets of second nodes to another of said plurality of sets of second nodes.

7. (Original) The interconnection system of claim 4, wherein said at least one first switch is shared with at least two of said plurality of sets of second nodes.

8. (Original) The interconnection system of claim 1, wherein each of said plurality of sets of second nodes is further divided into a plurality of sub-sets of second nodes.

9. (Original) The interconnection system of claim 8, wherein said plurality of sub-sets of second nodes in at least one of said plurality of sets of second nodes are interconnected to each other via a second switch.

10. (Original) The interconnection system of claim 8, wherein said plurality of sub-sets of second nodes are interconnected to each other via at least one of said at least one first switches within one of said plurality of first nodes.

11. (Original) The interconnection system of claim 1, wherein each second node in said plurality of sets of second nodes is configured with at least two communications ports.

12. (Original) The interconnection system of claim 1, wherein connections between second nodes in said plurality of sets of second nodes are partitioned into a plurality of incomplete fabrics.

13. (Original) The interconnection system of claim 1, wherein at least one of said plurality of first forwarding nodes are chosen from a group consisting of routers, switches, crossbars, optical rings, backplanes, buses, interconnections, and links.

14. (Original) The interconnection system of claim 1, wherein each second node in said plurality of sets of second nodes is interconnected to every other second node via at least one of said plurality of first nodes.

15. (Original) The interconnection system of claim 8, wherein said plurality of sub-sets of second nodes are interconnected to each other via one of said plurality of first forwarding nodes.

16. (Original) A method for configuring a communications network, comprising:

configuring interconnections of a plurality of first nodes as a balanced incomplete block design of the form 2-(v, k, 1) = b, wherein v first nodes, arranged in b groups of k first nodes, are interconnected such that a pair of first nodes appears in only one group of the b groups; and

configuring interconnections of a plurality of sets of second nodes to the plurality of first nodes, wherein each second node is interconnected to every other second node.

17. (Original) The method of claim 16, further comprising configuring interconnections of each second node in said plurality of sets of second nodes to every other second node via at least one of said plurality of first nodes.

18. (Original) The method of claim 16, wherein each of said plurality of first nodes includes at least one switch.

19. (Original) The method of claim 18, further comprising configuring interconnections of each second node in said plurality of sets of second nodes to every other second node via said at least one switch.

20. (Original) The method of claim 18, wherein said at least one switch interconnects one set of second nodes in said plurality of sets of second nodes to another set of second nodes in said plurality of sets of second nodes.

21. (Original) The method of claim 18, wherein at least one of said at least one switches is shared by at least two sets of second nodes in said plurality of sets of second nodes.

22. (Original) The method of claim 16, further comprising dividing said plurality of sets of second nodes into a plurality of sub-sets of second nodes.

23. (Original) The method of claim 22, further comprising configuring a plurality of first forwarding nodes to interconnect said plurality of first nodes.

24. (Original) The method of claim 23, wherein at least one of said plurality of first forwarding nodes is chosen from a group consisting of routers, switches, crossbars, optical rings, backplanes, buses, interconnections, and links.

25. (Original) The method of claim 23, further comprising configuring interconnections of each of said plurality of sub-sets of second nodes to other sub-sets of second nodes via

one of said plurality of first forwarding nodes.

26. (Original) The method of claim 23, further comprising configuring a plurality of second forwarding nodes to interconnect said plurality of sets of second nodes.

27. (Original) The method of claim 26, wherein at least one of said plurality of second forwarding nodes is chosen from a group consisting of routers, switches, crossbars, optical rings, backplanes, buses, interconnections, and links.

28. (Original) The method of claim 22, further comprising configuring interconnections of each of said plurality of sub-sets of second nodes to other sub-sets of second nodes via a switch within one of said plurality of first nodes.

29. (Original) The method of claim 16, wherein each second node in said plurality of sets of second nodes is configured with at least two communications ports.

30. (Original) The method of claim 16, further comprising partitioning connections among second nodes in said plurality of sets of second nodes into a plurality of incomplete fabrics.

31. (Original) The method of claim 16, wherein each second node in said plurality of sets of second nodes is connected to one of said plurality of first nodes.

32. (Original) A method for converting a mathematical design to a physical communications network, comprising:

providing a mathematical representation of a plurality of connected first nodes in the form of a balanced incomplete

block design defined as 2-(v, k, 1) = b, wherein v first nodes, arranged in b groups of k first nodes, are interconnected such that a pair of first nodes appears in only one group of the b groups;

converting the mathematical representation to a physical design in which a plurality of first forwarding nodes interconnect the plurality of first nodes; and

assigning a plurality of sets of second nodes to one of the first nodes; such that each of the second nodes is interconnected to every other node.

33. (Original) The method of claim 32, further comprising interconnecting each second node of said plurality of sets of second nodes to other second nodes via at least one of said plurality of connected first nodes.

34. (Original) The method of claim 32, wherein each of said plurality of connected first nodes includes at least one switch.

35. (Original) The method of claim 34, further comprising configuring interconnections of each second node of said plurality of sets of second nodes to other second nodes via said at least one switch.

36. (Original) The method of claim 34, wherein said at least one switch interconnects one of said plurality of sets of second nodes to another of said plurality of sets of second nodes.

37. (Original) The method of claim 34, wherein at least one of said at least one second switches is shared by at least two of said plurality of sets of second nodes.

38. (Original) The method of claim 32, further comprising dividing said plurality of sets of second nodes into a plurality of sub-sets of second nodes.

39. (Original) The method of claim 38 further comprising configuring interconnections of each of said plurality of sub-sets of second nodes to other sub-sets of second nodes via a switch.

40. (Original) The method of claim 39, wherein said switch is within one of said plurality of connected first nodes.

41. (Original) The method of claim 32, wherein each second node in said plurality of sets of second nodes is configured with at least two communications ports.

42. (Original) The method of claim 32, further comprising partitioning connections among second nodes in said plurality of sets of second nodes into a plurality of incomplete fabrics.

43. (Original) The method of claim 32, wherein at least one of said plurality of first forwarding nodes is chosen from a group consisting of routers, switches, crossbars, optical rings, backplanes, buses, interconnections, and links.

44. (Original) The method of claim 32, wherein said method is executed recursively.